IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of	:	**Docket No.**	**0805774-0004**
Mark Alistair POLETTI	:	**Art Unit**	**2643**
Application No. 09/197,096	:	**Examiner**	**LAO, LUN S**
Filed: November 20, 1998	:		

For: An Improved Guitar Preamplifier System With Controllable Distortion

DECLARATION

I, COLIN FOX, declare:

1. I am Head of the Acoustics Research Centre at the University of Auckland, New Zealand and have held this position since 1998. I have been a member of the Applied Mathematics Unit within the Mathematics Department of The University of Auckland since 1990.

2. I obtained a PhD degree from the University of Cambridge in 1989. The subject of my doctoral thesis was electrical impedance tomography within the departments of Physics and Applied Mathematics. I obtained BSc in Pure Mathematics and Physics from The University of Auckland in 1981, receiving the Senior Prize in Pure Mathematics and the Senior Prize in Physics. I obtained MSc with First Class Honours in Physics from the University of Auckland in 1983.

3. My areas of expertise and research include inverse problems, signal processing, wave propagation in electrical and mechanical systems, Bayesian inference, analogue and digital electronics for audio reproduction and computation, computational spectral analysis. I attach a copy of my CV and/or list of papers I have had published in peer review journals and conference papers I have presented.

4. I have been requested to review US patent 5,892,833 to MAAG (herein "Maag"). I have also reviewed a copy of what I am instructed is a copy of US patent application 09/197,096 (herein "the Poletti patent application"), the simulations described in paragraphs 10 and 11 of a declaration by Mark Poletti dated 25 February 2004, and a copy of an Office Action from the US Patent Office dated 24 May 2004.

5. I understand the Maag patent to describe a graphic equalizer for audio application, consisting of multiple filter banks with adjustable gain and summation, giving both analogue and digital electronic implementation.

6. The simulation described in paragraphs 10 and 11 and Fig. 1 of the Poletti declaration is in my opinion correct. Assuming that the individual channel filters of Maag have different centre frequencies, the term "equi-phase" could only correctly be applied to the output of the bands when summed together (with equal gain in each band and not with any other setting). This is consistent with the claim made by Maag.

7. At frequencies between the centre frequencies of adjacent filters (above the centre frequency of one filter and below the centre frequency of the next) and within the intended range of operation the adjacent filters described in Maag have different phase responses. This is very easy to show, for both the analogue and digital filters that Maag uses. It is shown by the simulations described in the Poletti declaration where, for example, the phase shift of the 300 Hz signal at the output of the individual filters is clearly different, for every filter bank.

8. Clearly the Maag filters, assuming that the centre frequencies of the filters are different so as to split the input signal into different frequency bands, do not have an equi-phase response. That is the signal at a given frequency passed by two filters which have appreciable response at that frequency, will not be in phase.

9. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with knowledge that wilful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such wilful false statements may jeopardize the validity of this Application for Patent or any patent issuing thereon.

DECLARED at The University of Auckland)
Auckland, New Zealand)
this 15 day of November 2004)

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Colin Fox - CV

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EDUCATIONAL QUALIFICATIONS:

1988 Cambridge University, PhD in Physics: Radio Astronomy, Thesis "Conductance Imaging" (1987: awarded the University's Lundgren Award for PhD thesis)
1983 University of Auckland, MSc in Physics, Thesis "An Acoustic Direction Finder", First Class Honours
1981 University of Auckland, BSc in Mathematics, Senior Prizes in Pure Mathematics and Physics

EMPLOYMENT:

1998-present The University of Auckland – Senior Lecturer in Mathematics, Head of Acoustics Research Centre
1987-1988 The University of Auckland -- Lecturer in Mathematics and Statistics
1987-1989 University of Otago – Postdoctoral fellow in Mathematics
1987-1990 Schlumberger Cambridge Research, Research Scientist
1981-1984 Partner -- Aleph Electronics

VISITING POSITIONS:

2004 Suomen Matemaattinen Yhdistys (Finnish Mathematical Society) and Kuopio University -- Invited Researcher, Finnish Theme Year on Inverse Problems .
2002 Investigador Titular "A", Departamento de Probabilidad y Estadística, CIMAT, Guanajuato, México
1999 University of Cambridge – Visiting Research Fellow, Engineering Department
1997 Otago University – Visiting Research Fellow
1993 Clarkson University -- Visiting Scientist

PROFESSIONAL MEMBERSHIPS:

Society of Industrial and Applied Mathematics SIAM 1998-present
Acoustical Society of America – elected member 2002
New Zealand Mathematical Society
New Zealand Acoustical Society
Institute of Electrical and Electronic Engineers IEEE – member since 1984

GRADUATE STUDENTS:

15 MSc and 5 PhD students completed

RESEARCH PUBLICATIONS:

Refereed Journal Articles:

CHRISTEN, J. ANDRÉS. AND FOX, COLIN, `Mcmc using an approximation', Journal of Computational and Graphical Statistics, accepted (2004).

JAMES SNEYD, M. FALCKE, J.-F. DUFOUR AND C. FOX, 'A Comparison Of Three Models Of The Inositol Trisphosphate Receptor'. Progress In Molecular Biology And Biophysics, In the press (2004).

HYUCK CHUNG AND COLIN FOX. `Propagation of flexural waves at the interface between floating plates'. International Journal of Offshore and Polar Engineering', accepted July 2002.

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EMMS, G.W., FOX, C. 'Control of sound transmission through an aperture using active sound absorption techniques: a theoretical investigation'. *Applied Acoustics* **62**, 735-747, 2001.

CHUNG, H., FOX C. 'Calculation of wave-ice interaction using the Wiener-Hopf technique. *New Zealand Journal of Mathematics*, (accepted March 2001).

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FOX, C., 'Real-Time Audio Processing on a PC'. *Journal of the New Zealand Acoustical Society*, 11-26, February 1997.

MEYLAN, M., SQUIRE, V.A. AND FOX, C. 'Towards Realism in Modelling Ocean Wave Behavior in Marginal Ice Zones'. *Journal of Geophysical Research*, 102, 22981-22991, October 15, 1997.

FOX, C. AND SQUIRE, V.A. 'On the oblique reflexion and transmission of ocean waves at shore fast sea ice'. *Phil Trans R. Soc. Lond.* A 347, 185-218, 1994.

FOX, C. AND SQUIRE, V.A. 'Coupling between the ocean and an ice shelf'. *Annals of Glaciol*ogy 15, 101-107, 1991.

FOX, C. AND SQUIRE, V.A. 'Strain in Shore Fast Ice due to Incoming Ocean Waves and Swell'. *Journal of Geophysical Research* 96-C3, 4531-4547, March 15, 1991.

SQUIRE, V.A., FOX, C. 'The role of incoming waves in ice edge dynamics'. *Annals of Glaciol*ogy 15, 96-100, 1991.

FOX, C., SQUIRE, V.A., 'Reflection and transmission characteristics at the edge of shore fast sea ice'. *Journal of Geophysical Research* 95-C7, 11,629-11,639, July 15, 1990.

Papers in Refereed Conference Proceedings:

FOX, C., BALLAGH, K. 'In situ measurement of power flow and mechanical properties of vibrating timber structures'. InterNoise 2001, The 2001 International Congress and Exhibition on Noise Control Engineering, The Hague, The Netherlands, August 27-30, 2001.

FOX, C., G.K. NICHOLLS, G.K. 'Exact MAP states and expectations from perfect sampling: Greig, Porteous and Seheult revisited'. *Bayesian Inference and Maximum Entropy Methods in Science and Engineering, 20th International Workshop* (Gif-sur-Yvette), 8-13 July 2000, edited by Ali Mohammad-Djafari, AIP Conference Proceedings volume 568, 252-263, American Institute of Physics, New York, 2001.

FOX, C. 'Scaling laws for flexural waves in floating ice'. Proceedings of IUTAM: *Scaling Laws in Ice Mechanics and Ice Dynamics*, J.P. Dempsey, H.H. Shen, L.H. Shapiro (eds) University of Alaska Fairbanks, June 13-16, 2000.

FOX, C. 'Measurement of directional wave spectra in fast ice'. In Ice in Surface Waters 2, Proceedings of the 14th International Symposium on Ice. H.T. Shen, ed. Balkema, Rotterdam, 849–853, 1999.

DEMPSEY, J.P., FOX, C., PALMER, A.C. 'Ice-slope interaction: transitions in failure mode'. In Proceedings of OMAE99, 18th International Conference on Offshore Mechanics and Arctic Engineering, July 11-16, St. Johns, Newfoundland, Canada, 1999.

FOX, C. AND NICHOLLS, G. 'Sampling Conductivity Images via MCMC'. In*: The Art and Science of Bayesian Image Analysis*, K.V. Mardia, C.A. Gill, R.G. Aykroyd eds, Proceedings of the Leeds Annual Statistical Research Workshop (LASR), 91-100, July 1997, Leeds University Press, 1997.

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